

Assessment of Knowledge and Perception of Indian Dentists Towards Covid-19: A Questionnaire Study

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ABSTRACT

Background: An unprecedented global war is going on and whole mankind is facing the same villain, the novel corona virus. The battlefield now is the hospitals and health workers are our soldiers. As the dentists are exposed to aerosols and droplets coming out from patient's oral cavity, they are at high risk of getting infected. With the rapid growth curve of this pandemic, there is a huge setback in the financial status of dentist. Therefore dentistry today needs a complete structural change to revive their practice as well as minimise the risk of cross-infection.

Materials and Methods: The study population consisted of dentists who work as private or government clinicians and health practitioners in India. A cross sectional study was conducted by administering a well-structured questionnaire consisting 43 questions and comprising 3 sections which included demographic characteristics, knowledge and perceptions of dentists regarding COVID 19 and their dental practice. A self-administered multiple-choice question were sent to all the participants and submitted via Google forms.

Results: The total number of respondents was 500 with a response rate of 50%. The present study showed equal participation of male and female dentists. A majority of participants were aware about the etiology (97%), mode of transmission (94.7%) and incubation period (98%). The study reported that only 72.5% of subjects were aware of training series covering the basic principles of infection prevention and control by CDC such as using PPE training and health care respiratory protection resources training.

Conclusion: Indian dentists were aware about the COVID-19 symptoms, mode of transmission, infection control and measures in their dental clinic. However, there was a lacuna in knowledge about the extra precautionary measures that protect the dental staff and other patients from COVID-19.

Keywords: COVID-19, CDC Guidelines, Dentistry, Questionnaire, Awareness, Infection Control.

INTRODUCTION

The world is facing a pandemic due to COVID-19 caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2)¹. Currently 1.58 million cases have been reported in India². To limit the spread, a nationwide lockdown was imposed for three months. Dentists face a sword of Damocles as they have a high risk of getting

infected due to procedures involving the use of high-speed hand pieces or ultrasonic instruments that may aerosolize the virus³. This study aims to assess the knowledge and perception of COVID-19 in Indian dentists. Such information is needed to understand the hurdles

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faced by our fraternity and create a better post pandemic dental practice situation.

Materials and Methods:

A cross sectional qualitative online study was conducted from 3rd August 2020 to 15th August 2020 among dental professionals present all over India. The study was approved by the ethical committee of Bhabha College of Dental Sciences (2020/ACAD/355A), Bhabha University, Bhopal, Madhya Pradesh, India. The sample size was determined by doing a pilot study among 150 dentists. 150 samples were divided into 50 random samples 20 times to obtain standard deviation of the population. Based on the equation

$$n = \left(\frac{Z \sigma}{d} \right)^2$$

Where, Z= standard normal score with 95% of confidence interval ($\alpha = 0.05$)

d= margin of error (d= 0.5)

σ = standard deviation of sample

we got the estimated sample size to be 484.

i. Survey design:

The online questionnaire comprised of 42 multiple choice questions in 3 different sections as shown in Figure 1. Section A comprised the socio-demographic characteristics and of dentists and section B was knowledge based on COVID 19 and awareness regarding their treatment control and section C was based on the perception and behaviour of dentist towards COVID 19. The questionnaire was based on the guidelines given by Ministry of Health and Welfare, Government of India, Dental Council of India and Centers of Disease Control. The paper mainly focuses on section B.

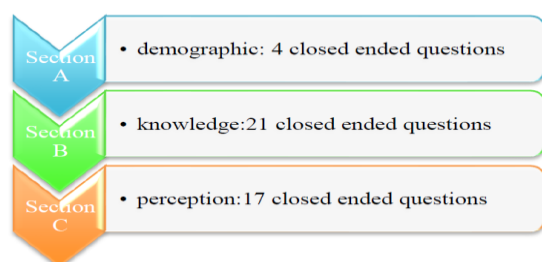


Fig 1: Survey structure

ii. Sampling method:

The questionnaire was made in Google forms. The forms were circulated among the dentists through different social media platforms such as Facebook, Instagram and Whatsapp and not handed over directly to reduce the spread of virus. A total of 500 dentists residing in various parts of India participated in this survey. A simple random sampling was carried out.

iii. Inclusion criteria:

Dental practitioners

iv. Exclusion criteria:

Undergraduate and Post graduate students

v. Statistical analysis:

Data was analyzed through python programming. Descriptive statistical analysis was used to describe variables included in the study. Mean scores and standard deviations were calculated and were used to describe the continuous variables. Percentages were used to describe the categorical data. Analysis of Variance test (ANOVA) was used to find significance between two groups. The significance level was set at <0.05.

RESULTS

i. Socio-demographic characteristics

The total number of respondents was 500 with a response rate of 50% (500 out of 1000 invited dentists). The descriptive data is presented in figure 2. The present study showed equal participation of male and female dentists. More number of respondents was graduates (55%) and rest (45%) had post graduate degree in dentistry. Most of them were working in private sector (92%). Regarding the location of the respondents 39% were residing in urban area, 38% were living in semi urban area and 23% in rural part of India.

Response to questions regarding knowledge

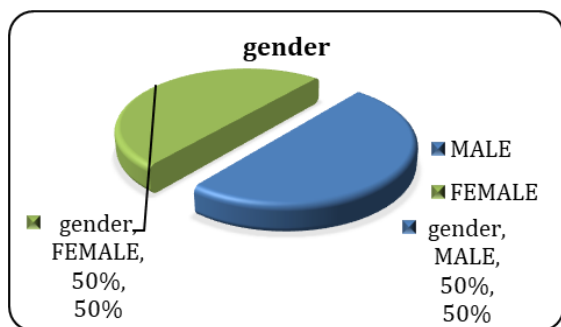


Fig 1: Summary of participants demographics.

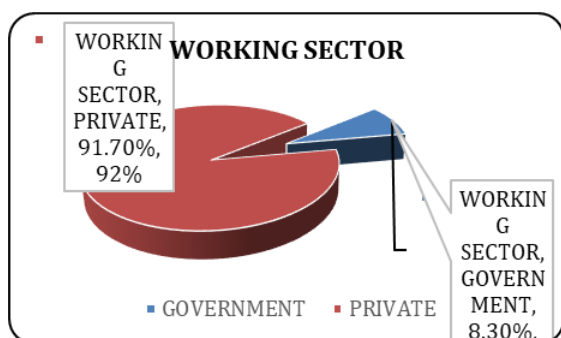


Fig 2: Summary of participants demographics.

a) COVID 19

A majority of participants were aware about the etiology (97%), mode of transmission (94.7%) and incubation period (98%). Regarding the preventive measures such as active screening of each patients and pre procedural testing, 91.7% and 87.1% were having excellent knowledge. Most of them regularly monitored themselves for symptoms (95%) and enquired about patients travel history (96%).

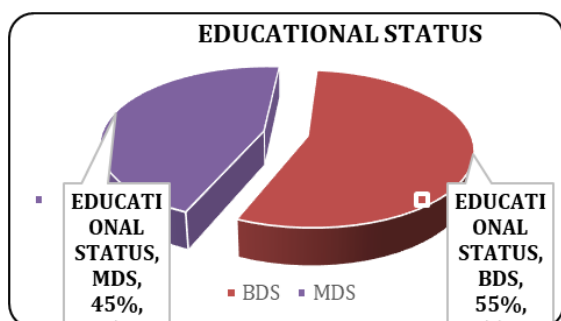


Fig 3: Summary of participants demographics.

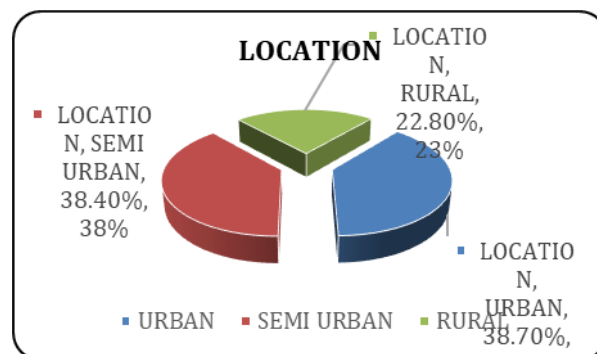


Fig 4: Summary of participants demographics.

b) Dental office settings:

Majority of dentists (84%) were aware of the minimum distance in waiting rooms as well as minimizing the practice of patients (83.1%).

Only 67.1% dentists considered four handed dentistry as a good option to minimize droplet spread.

c) Personal hygiene and clinic hygiene practices:

The study reported that only 72.5% of subjects were aware of training series covering the basic principles of infection prevention and control by CDC such as using PPE training and health care respiratory protection resources training. More than half of the subjects had knowledge about the extended period for use of N95 respirators (77.8%) and the alternatives (59%) for them. 82.1% of participants used soap and water as well as alcohol rub to wash their hands before and after doing treatment. Majority of them were aware of aerosol generating procedures (94.4%) and PPE recommendation while doing such procedures (98.3%). 88% of them were considering the need of rubber dam isolation. Surprisingly only 59% of people were considering to wait 15 minutes in between performing patients. Regarding the sterilization protocol, 85% of participants used HEPA air filters with fumigation procedures. The better choices of disinfectant for half of them (69%) were either sodium hypochlorite or chlorine containing disinfectants. Hydrogen peroxide (29.6%) and 0.2% povidine iodine (64.6%) was the choice of pre-procedural antimicrobial mouth rinse.

d) Knowledge scores of the subjects:

Based on different scores, categorical features have been grouped in three cluster using K Means algorithm in machine learning. They were classified as average, good and excellent. 28% of the subjects performed average. Most of them were from semi urban and rural areas of India and are BDS dentists. 34% of them were having good knowledge scores. 38% of them have excellent scores and

out of which most are MDS dentists residing in urban areas. The final knowledge scores regarding COVID 19 have been given in the table 1. The mean knowledge scores for each demographic variable are stated in table 2.

It was found that there was statistically significant association of mean knowledge score with educational level ($p = 0.001$) whereas no significant difference was noted in gender, location and working sector ($p > 0.05$)

Table 1: Final knowledge scores of respondents regarding COVID 19 (calculated using K means algorithm)

	<i>Average</i>	<i>good</i>	<i>excellent</i>	<i>category</i>
1	32.75%	31.03%	36.20%	Semi urban
2	34.75%	30.43%	34.78%	Rural
3	21.36%	38.46%	41.02%	Urban
4	30.46%	36.42%	33.11%	Female
5	26.49%	31.12%	42.38%	Male
6	28.15%	36.8%	35.01%	Private
7	32%	0%	68%	Government
8	20.58%	34.55%	44.85%	MDS
9	34.93%	33.13%	31.92%	BDS

Table 2: Mean knowledge scores of respondents according to different demographic variables.

	Population (percentage)	Mean	Standard deviation	F value	P value
Female	50%	16.94	2.48	1.11	0.29
Male	50%	17.23	2.84		
Urban	38.74%	17.48	2.84		
Rural	22.84%	16.75	2.80	2.16	0.11
Semi urban	38.42%	16.86	2.73		
BDS	54.96%	16.65	2.77	10.14	0.001*
MDS	45.04%	17.62	2.43		
Private	91.72%	17.02	2.65	2.15	0.14
Government	8.28%	17.84	2.77		

$P < 0.05$ (statistically significant), using ANOVA test

ii. Perception and attitude towards COVID 19 and its treatment

The perceptions of dentists towards COVID 19 have been summarized in table 3. In this section perception of dentists towards economy,

treatment, government, family, general awareness were asked. The novel corona virus is highly contagious and has been declared an "international public health emergency" by WHO.⁴ The questions asked included whether

they will treat the patients with COVID 19 (48.5% said yes) or with the symptoms like cough and sneeze? (59.2% agreed), are they satisfied with government response to pandemic (49% were not satisfied) or economy

(65.1% were not satisfied). The subjects were also asked about the loss of income because of lockdown (86% were worried about it). 64.1 % of dentists are following the rules and regulations given by Dental Council of India.

Table 3: Perception table.

QUESTIONS	OPINIONS	BDS	MDS	RURAL	SEMIURBAN	URBAN	FEMALE	MAL	GOVERNMENT	PRIVATE
Do you think that current events about Covid-19 had made you close to your family?	Maybe	6.63	5.88	4.35	6.90	6.84	5.30	7.28	4.00	6.60
	No	5.42	4.41	1.45	6.03	5.58	3.35	6.62	-	5.42
	Yes	87.95	89.31	94.20	87.07	87.18	91.39	86.09	96.00	88.09
Do you think the economy has an impact because of lockdown?	Maybe	4.82	0.74	1.45	2.59	4.27	1.99	3.97	0	3.25
	No	1.81	0.74	2.90	0.86	0.85	1.32	1.32	4	1.08
	Yes	93.37	98.53	95.65	96.55	94.87	96.69	94.70	96	95.67
Are you worried about going back to work and being in risk of COVID 19	Maybe	8.43	10.29	7.25	11.21	8.55	11.26	7.28	12.00	9.03
	No	11.45	19.85	10.14	18.10	15.38	13.91	16.56	16	15.16
	Yes	80.12	69.85	82.61	70.69	76.07	74.83	76.16	72.00	75.81
Will you treat COVID 19 patients?	Maybe	17.47	20.74	23.19	16.38	18.97	25.17	12.67	12.00	19.57
	No	28.92	37.04	28.99	32.76	34.48	33.11	32.00	12.00	34.42
	Yes	53.61	42.22	47.83	50.86	46.55	41.72	55.33	76.00	46.01
Do you think number of dental patients will increase after Post COVID 19?	Maybe	27.71	22.79	26.09	25.86	24.79	26.49	24.50	4.00	27.44
	No	15.66	15.44	21.74	16.38	11.11	15.89	15.23	28.00	14.44
	Yes	56.63	61.76	52.17	57.76	64.10	57.62	60.26	68.00	58.12
Are you satisfied with the government's response to	Maybe	13.86	13.97	20.29	9.48	14.53	15.89	11.92	8.00	14.44
	No	53.61	43.38	44.93	56.03	44.44	49.67	48.34	64.00	47.65

the pandemic?	Yes	32.53	42.65	34.78	34.48	41.03	34.44	39.74	28.00	37.91
Are you satisfied with government response against economic crisis?	Maybe	16.36	14.71	15.94	15.52	15.52	20.00	11.26	12.00	15.94
	No	63.03	67.65	66.67	65.52	63.79	65.53	64.90	80.00	63.77
	Yes	20.61	17.65	17.39	18.97	20.69	14.67	23.84	8.00	20.29
Are you worried about the loss of income because of lockdown?	Maybe	4.27	3.68	2.94	4.31	4.31	4.70	3.31	8.0	3.64
	No	9.76	8.82	11.76	9.48	7.76	7.38	11.26	4.00	9.82
	Yes	85.98	87.50	85.29	86.21	87.93	87.92	85.43	88.00	86.55
Are you worried about the consequences of income loss affect your family?	Maybe	6.06	7.35	5.80	6.90	6.90	4.00	9.27	4	6.88
	No	7.27	12.50	7.25	12.93	7.76	12.00	7.28	4	10.14
	Yes	86.67	80.15	86.96	80.17	85.34	84.00	83.44	92.00	82.97
Do you want to close the clinic until there is a decrease in COVID 19 patients?	Maybe	19.88	16.18	13.04	19.30	20.18	21.23	15.23	12.00	18.75
	No	41.61	44.85	44.93	39.47	45.61	41.78	44.37	24.00	44.85
	Yes	38.51	38.97	42.03	41.23	34.21	36.99	40.40	64.00	36.40
Are you afraid of getting infected by a patient or co worker?	Maybe	13.41	15.44	11.76	15.65	14.53	17.22	11.41	32.00	12.73
	No	15.24	11.03	10.29	12.17	16.24	7.28	19.46	24.00	12.36
	Yes	71.34	73.53	77.94	72.17	69.23	75.50	69.13	44.00	74.91
Are you afraid of treating patient who is coughing or sneezing?	Maybe	22.56	14.81	20.29	19.30	18.10	16.78	21.33	20.00	18.98
	No	25.61	17.04	18.84	24.56	20.69	14.09	29.33	36.00	20.44
	Yes	51.83	68.15	60.87	56.14	61.21	69.13	49.33	44.00	60.58
Are you afraid of getting quarantine after infected?	Maybe	8.48	8.09	13.04	7.76	6.03	10.67	5.96	12.00	7.97
	No	56.97	61.76	42.03	62.93	65.52	59.33	58.94	72.00	57.97
	Yes	34.5	30.1	44.93	29.31	28.45	30.00	35.10	16.00	34.06

		5	5							
Are you anxious about the cost of treatment after getting infected?	Maybe	12.0 5	5.88	4.35	10.34	11.11	9.27	9.27	8.00	9.39
	No	13.8 6	22.7 9	17.39	20.69	15.38	15.89	19.87	36.00	16.25
	Yes	74.1 0	71.3 2	78.26	68.97	73.50	74.83	70.86	56.00	74.37
Are you aware of the authority to contact after coming in contact with a patient?	Maybe	5.42	2.94	4.35	4.31	4.27	3.97	4.64	0	4.69
	No	9.04	10.2 9	8.70	12.07	7.69	10.60	8.61	8.00	9.75
	Yes	85.5 4	86.7 6	86.96	83.62	88.03	85.43	86.75	92.00	85.56
Are you afraid after hearing the number of mortality rate because of COVID 19?	Maybe	27.7 1	27.9 4	14.49	29.31	34.19	21.85	33.77	44.00	26.35
	No	11.4 5	4.41	10.14	9.48	5.98	7.95	8.61	4.00	8.66
	Yes	60.8 4	67.6 5	75.36	61.21	59.83	70.20	57.62	52.00	64.98
Which organization guidelines are you following?	CDC	9.04	13.2 4	7.25	10.34	13.68	13.91	7.95	8.00	11.19
	DCI	63.8 6	55.1 5	56.52	62.93	58.97	51.66	68.21	72.00	58.84
	IDA	12.6 5	11.0 3	17.39	11.21	9.40	13.91	9.93	8.00	12.27
	WHO	14.4 6	20.5 9	18.84	15.52	17.95	20.53	13.91	12.00	17.69

DISCUSSIONS

COVID 19 is a global crisis and its outbreak has made people all over the world hysterical and created a void in health care systems and social policies. With total number of cases of 4.11 million in India till date and a death rate of 1.72% this has become an unprecedented challenge causing a deep impact on economy and health services.

On 9th July 2020, while giving opening remarks about COVID 19 WHO's Director General said that the "pandemic has brought in disruption and has exploited the inequalities in our health systems and the schisms in our societies. It has exposed existing inequities, widening and deepening the cracks between us".⁵The current

study was conducted to know the knowledge levels and attitude of dentists in this period of pandemic. Majority of participant knowledge levels were adequate with some knowledge deficiency in some questions.

There was equal number of male and female participants which was in contrast with the other studies.^{6, 7} Nonetheless Indian dentists in this survey was could identify the main symptoms of COVID-19, which helps dentists to recognize the threat and take the necessary actions, which considered a ground stone in the management.⁸ participants with post graduate degree were having more knowledge than the under graduate degree holders which was in accordance with the study conducted by

Gambhir et al.⁶ More than 90% were private practitioners partially explaining the significant apprehension for the economic situation of their activities and personal finance. Few studies also showed similar results.⁹

Based on the guidelines of WHO, Indian government and CDC, dentists should take strict personal protection measures and avoid or minimize operations that may produce droplets or aerosols.^{3, 10, 11} A four handed technique is useful infection control. Majority of the participants were having good knowledge about this and it was in accordance with some studies.⁷ Hand hygiene has been considered the most vital measure for minimizing the risk of transmitting microorganism to patients.¹² More than 80% participants used soap water and alcohol rub before and after the treatment similar to other studies.⁶ A vast number of participants were disinfecting their clinics and using HEPA air filtration units as a sterilization protocol. The participants had poor knowledge about optimum time to wait between each patient. So there was a lacunae observed while following the sterilization protocol.

The use of PPE, like masks (N-95), gloves, gowns, and goggles or face shields, is recommended to protect skin and mucosa from (potentially) infected blood or respiratory secretions.¹³ Appropriate use of PPE significantly reduces risk of viral transmission. Astonishingly, one-third of subjects in the present study were not fully aware regarding N95 masks use period and half of them were unaware of the alternatives.

Dentists considered the virus infection highly contagious, and they were not confident in being able to work safely. The major part of the participants answered that they would refuse to treat COVID 19 patients or symptoms presenting with a cough.

Despite the results observed here, this study had few limitations such as lower response rate. This may be due to lockdown present in various part of country or due to the subjects feeling hysterical and more concerned in their personal affairs. This study was relied upon self-reported

data, which is dependent upon subjects' honestly and recall ability.

CONCLUSION

Indian dentists were aware about the COVID-19 symptoms, mode of transmission, infection control and measures in their dental clinic. However, there was a lacuna in knowledge about the extra precautionary measures that protect the dental staff and other patients from COVID-19. Even the dentists were apprehensive about treating COVID 19 patients and cost of treatment after getting infected. This gap can only be bridged by introducing proper training courses and workshops for all the dentists about COVID 19 and its management. Some economical support from the governments and bank is also a need of hour.

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CONFLICTS OF INTEREST

The authors declare they have no potential conflict of interests regarding this article.

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